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(54) **BARRIER ASSEMBLY FOR A WHEELCHAIR LIFT**

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E04F 10/00 (2006.01)

(52) **U.S. Cl.** **187/200**; 160/37

(58) **Field of Classification Search** 187/200–202; 160/36, 37

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

45,366	A *	12/1864	Vrydagh	160/36
1,009,046	A *	11/1911	Busch	160/188
1,209,129	A *	12/1916	Coss	160/33
1,275,477	A *	8/1918	Ruble et al.	160/188
1,782,110	A *	11/1930	Wetzler	217/62
1,828,065	A *	10/1931	Palm	187/333
2,231,005	A *	2/1941	Gordon	312/260
3,989,084	A *	11/1976	Inamura et al.	160/36
4,595,043	A *	6/1986	Nozawa et al.	160/36
4,953,665	A	9/1990	Paquin	
4,966,219	A *	10/1990	Sonolet	160/201
4,977,981	A	12/1990	Paquin	
5,236,260	A *	8/1993	Yu	312/297
6,182,798	B1 *	2/2001	Brady et al.	187/282
6,305,456	B1 *	10/2001	Sanchez	160/188
2003/0213653	A1 *	11/2003	Morris	187/269

OTHER PUBLICATIONS

International Search Report dated Jul. 11, 2008, issued in corresponding Application No. PCT/US06/35115, filed Sep. 6, 2006.

* cited by examiner

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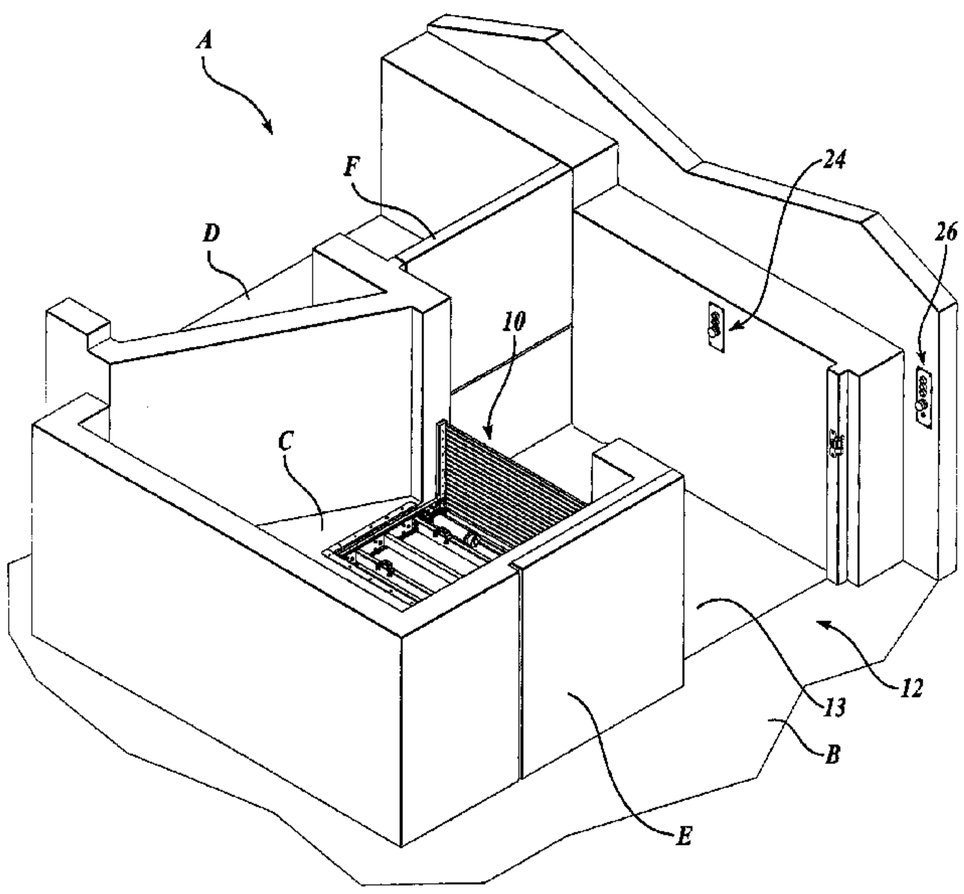
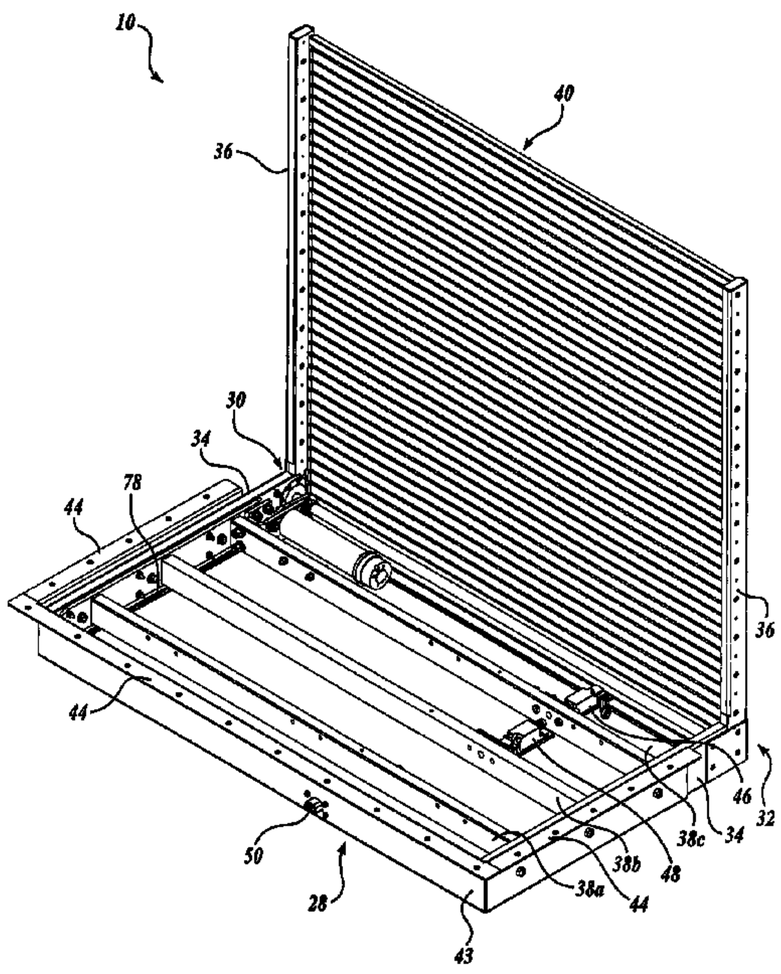
(57) **ABSTRACT**

A barrier assembly for a wheelchair lift assembly is provided. The wheelchair lift assembly includes a lift frame and a platform reciprocally coupled to the lift frame. The barrier assembly includes a frame having a first side rail and a second side rail. The frame is coupled to at least one of the lift frame or a structural frame. The barrier assembly also includes a barrier slidably disposed between the first and second side rails. A drive assembly is operably coupled to the barrier for selectively moving the barrier between at least a stowed position and a deployed position.

14 Claims, 6 Drawing Sheets





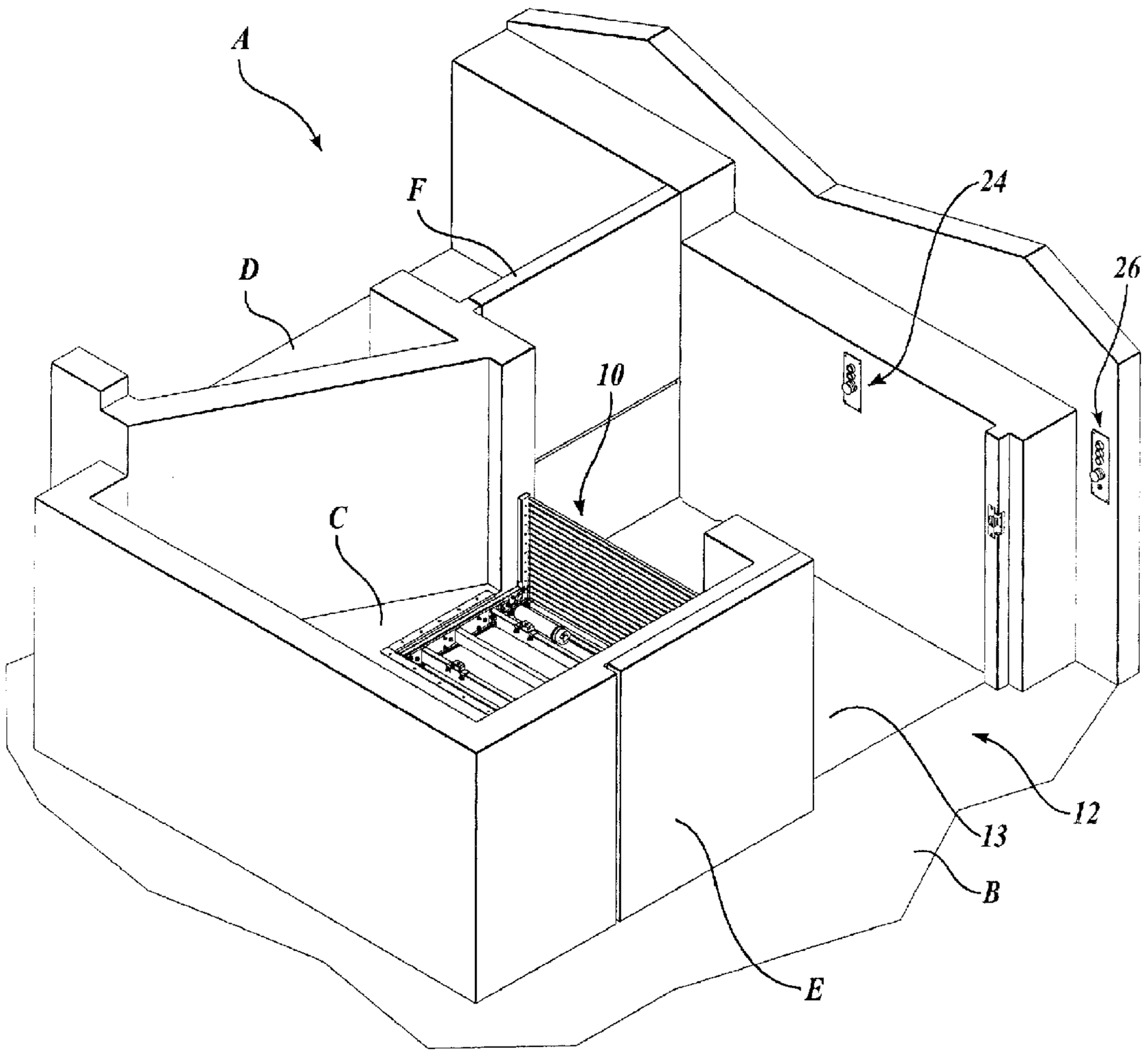


Fig.1.

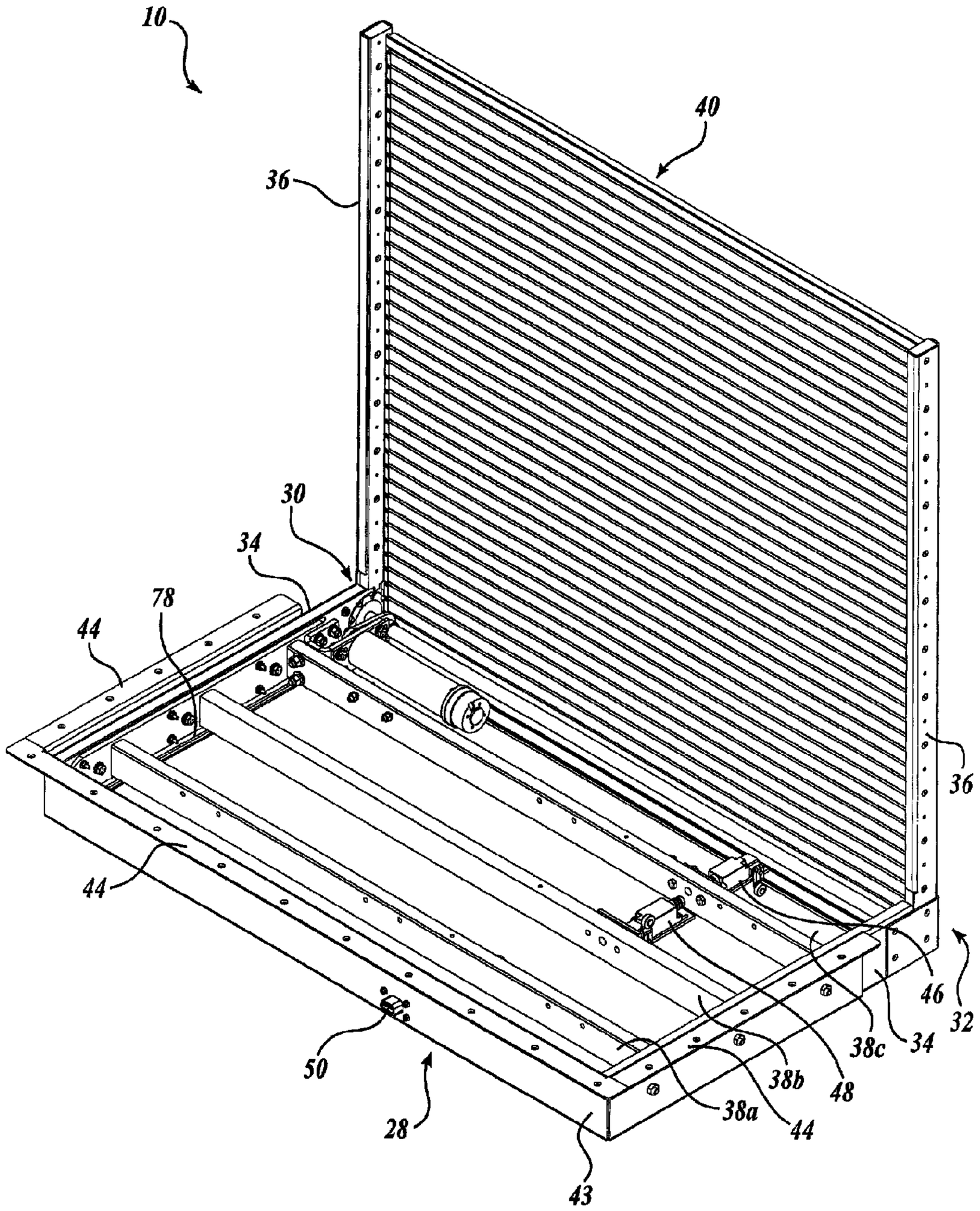


Fig.2.

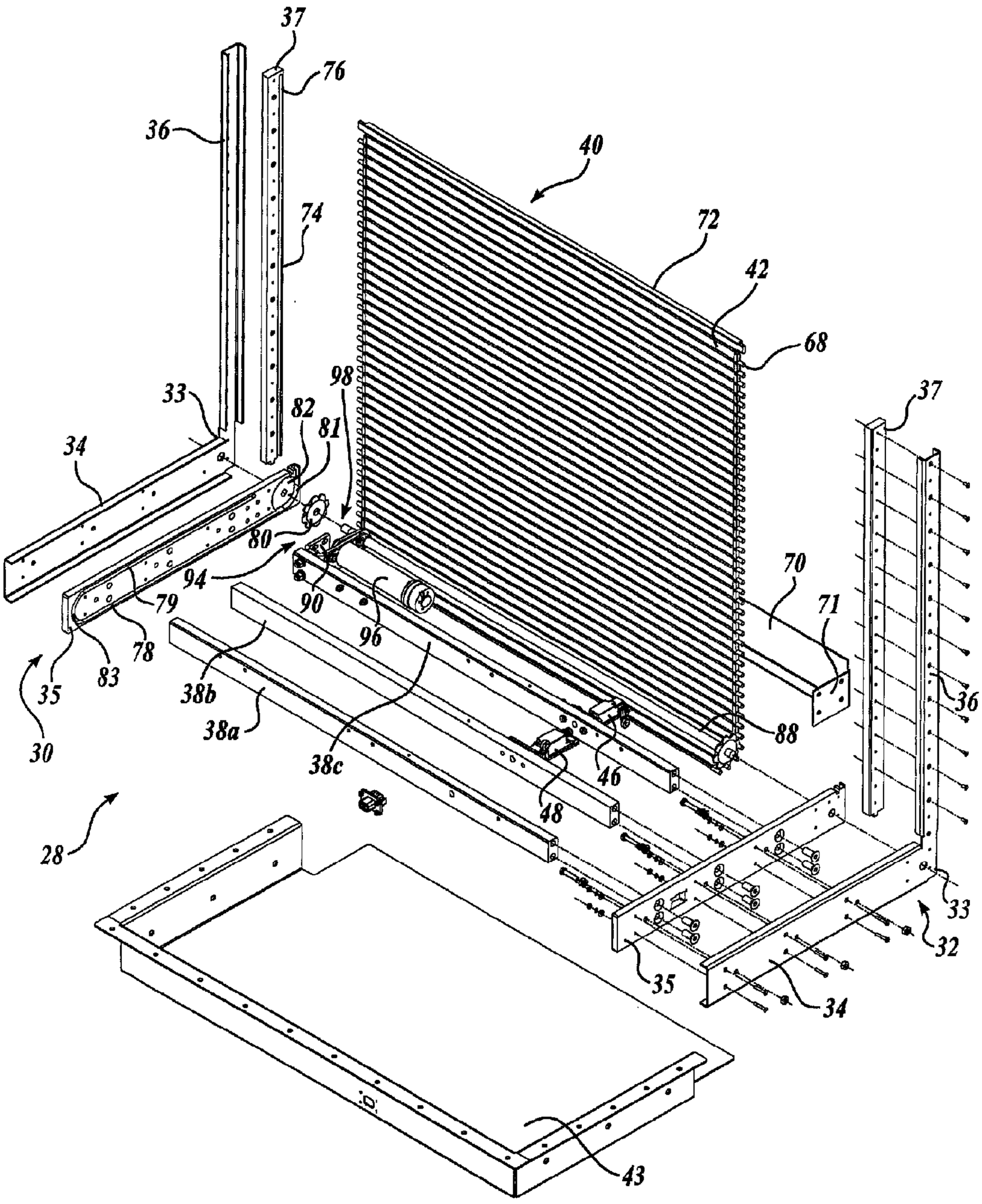

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Fig.3.

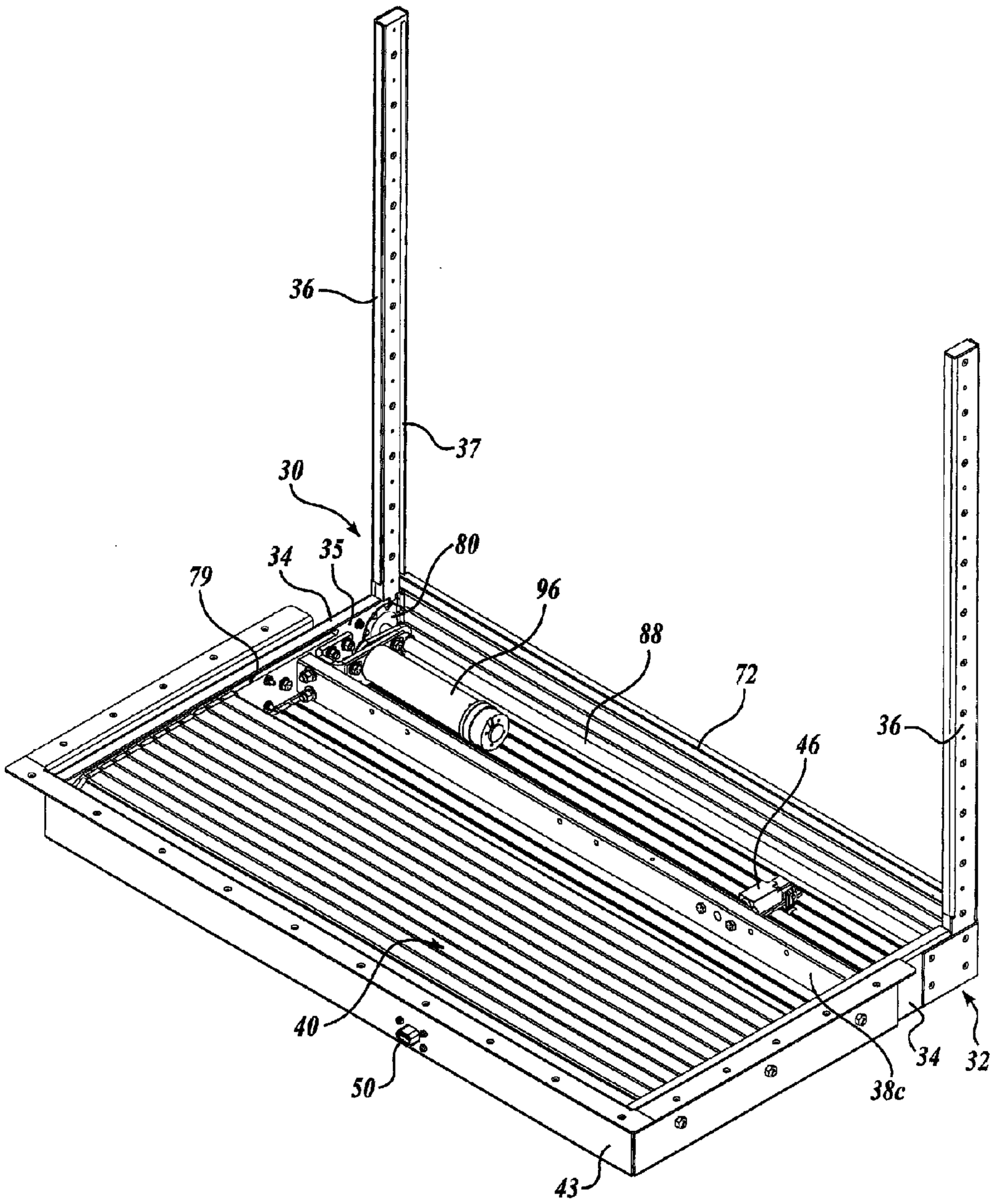

Fig.4.

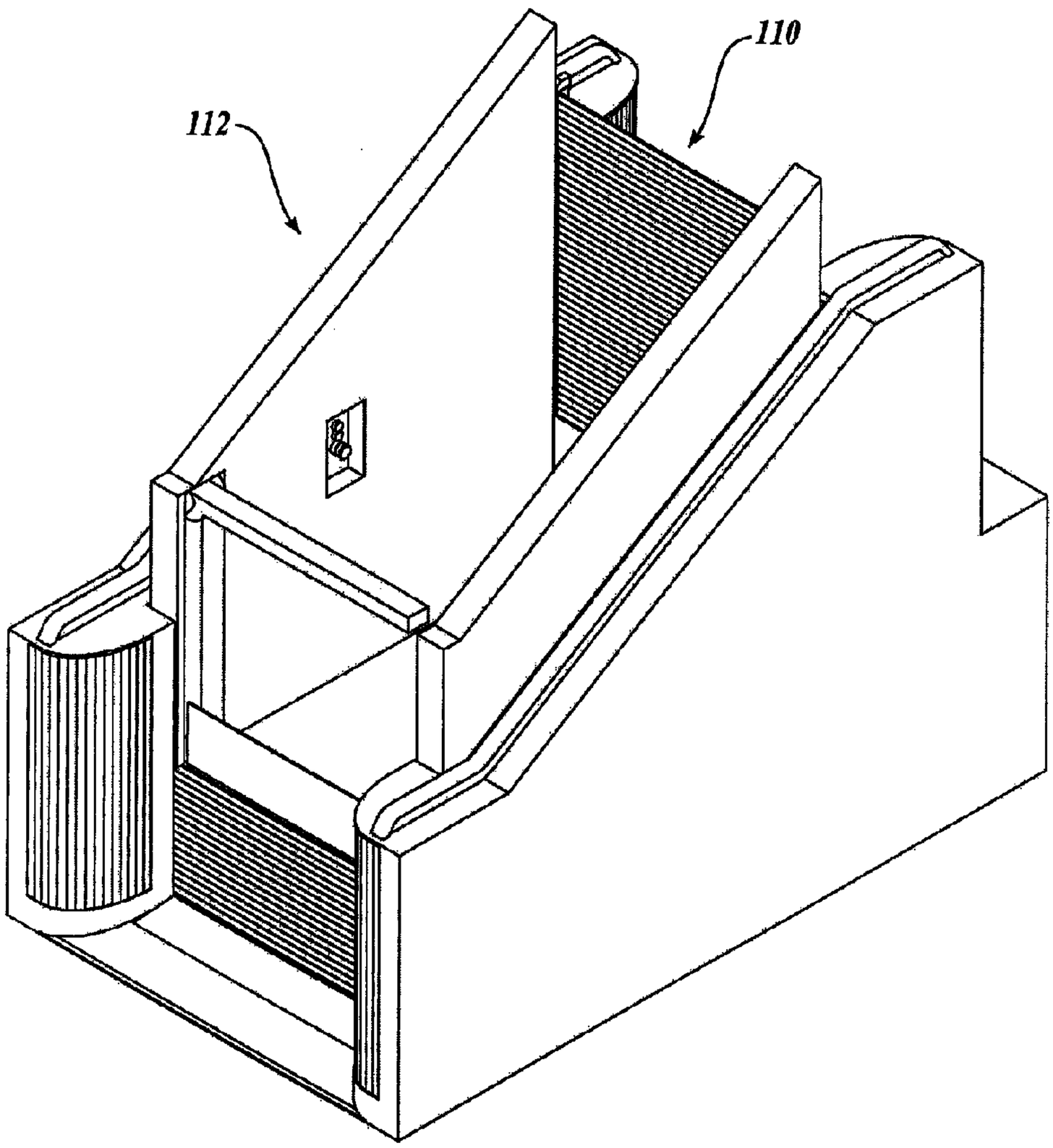

Fig.5.

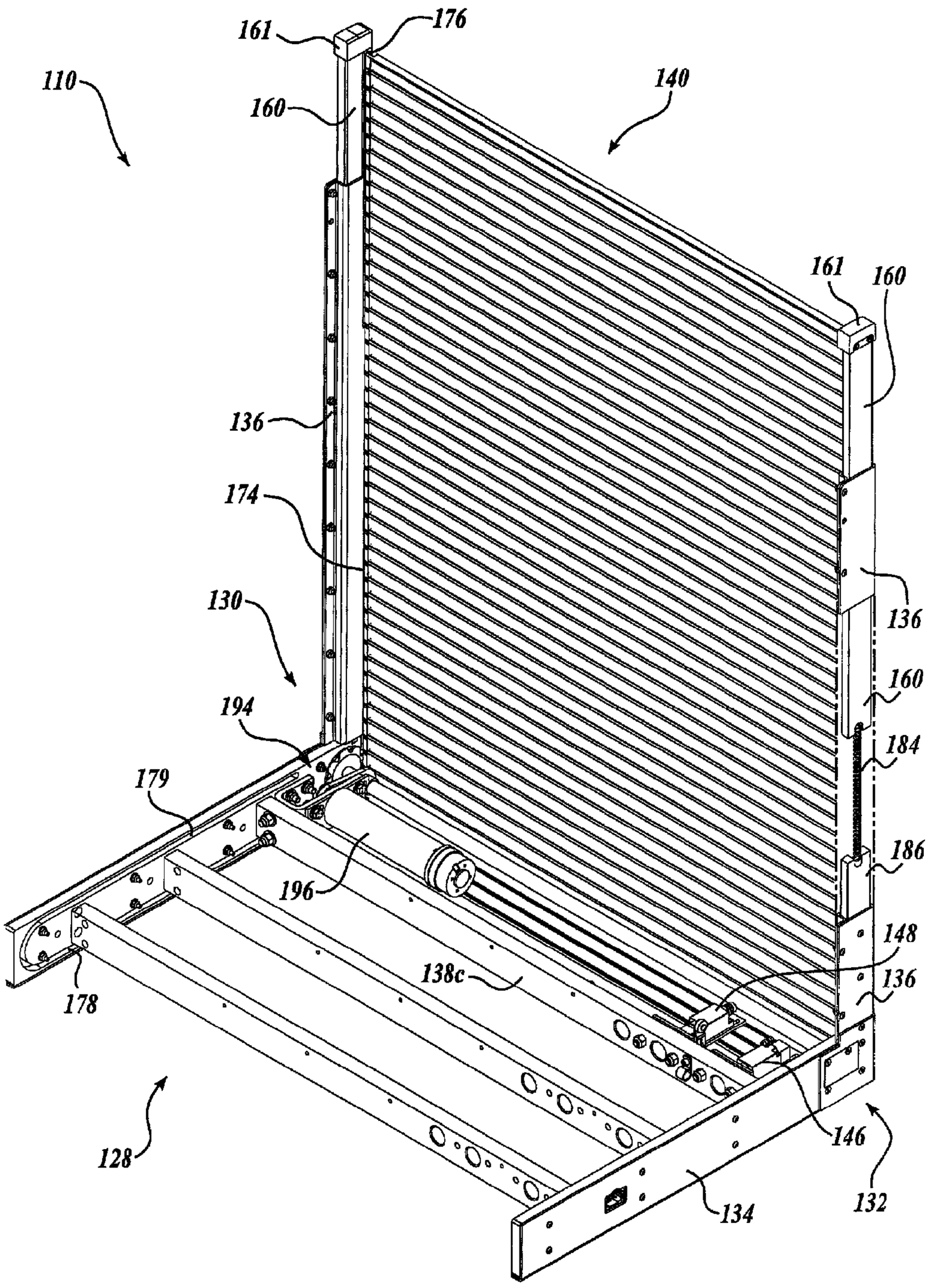
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Fig. 6.

BARRIER ASSEMBLY FOR A WHEELCHAIR LIFT

BACKGROUND

Persons with mobility impairments often depend on a wheelchair or walking aid to facilitate mobility. As a result, they are frequently subjected to physical barriers and obstacles such as stairs and curbs. Current ADA legislation requires that these physical barriers be removed, and as a result, ramps have been designed to address this need. However, ramps can be very long and difficult to climb. Further, depending on the elevation change and available space, ramps may be impractical. One solution is a wheelchair lift. Wheelchair lifts for commercial buildings and private residences must be designed and tested to meet the requirements of the ASME Code: A18.1, SAFETY STANDARD FOR PLATFORM LIFTS AND STAIRWAY CHAIRLIFTS.

Platform lifts for wheelchairs have been developed for use in courtrooms, church pulpits, meeting chamber podiums, and other similar environments. These types of installations must not only provide a means for safe level changes, but must also be sensitive to decorum and surrounding architecture. Moreover, certain multi-level environments, such as courtrooms, require a lift that services multiple levels, such as the witness stand and the judge's bench. In a courtroom, the witness stand, or intermediate level, is not normally large enough to accommodate a hinged door. Thus the potential for an unsafe condition occurs when the lift platform is raised above the witness level, and conversely when the lift platform is lowered from witness level to courtroom floor level. This condition may also be present for a variety of other wheelchair lift assemblies when the lift is being moved.

SUMMARY

A barrier assembly for a wheelchair lift assembly is provided. The wheelchair lift assembly includes a lift frame and a platform reciprocally coupled to the lift frame. The barrier assembly includes a frame having a first side rail and a second side rail. The frame is coupled to at least one of the lift frame or a structural frame. The barrier assembly also includes a barrier slidably disposed between the first and second side rails. A drive assembly is operably coupled to the barrier for selectively moving the barrier between at least a stowed position and a deployed position.

This summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This summary is not intended to identify key features of the claimed subject matter, nor is it intended to be used as an aid in determining the scope of the claimed subject matter.

DESCRIPTION OF THE DRAWINGS

The foregoing aspects and many of the attendant advantages of the claimed subject matter will become better understood by reference to the following detailed description, when taken in conjunction with the accompanying drawings, wherein:

FIG. **1** is an environmental view of a representative embodiment of a barrier assembly suitable for use with a wheelchair lift assembly constructed in accordance with one embodiment of the present disclosure, wherein the barrier assembly is in the deployed position;

FIG. **2** is an isometric view of the barrier assembly of FIG. **1**;

FIG. **3** is an exploded view of the barrier assembly of FIG. **2**;

FIG. **4** is an isometric view of the barrier assembly of FIG. **2** in a stowed position;

FIG. **5** is an environmental view of an alternate representative embodiment of a barrier assembly suitable for use with a wheelchair lift assembly;

FIG. **6** is an isometric view of the barrier assembly of FIG. **5** partially broken away.

DETAILED DESCRIPTION

A barrier assembly **10** constructed in accordance with one embodiment of the present disclosure is best seen by referring to FIG. **1**. The barrier assembly **10** is shown in combination with a wheelchair lift assembly **12**; however, it should be appreciated that the scope of the barrier assembly **10** is not so limited, with other uses being within the scope of the present disclosure. From time to time throughout this specification, directional terms, such as vertical, horizontal, top, bottom, etc., are used in the description of various components. It should be apparent that the use of such terms is merely for convenience and, as such, is not intended to limit the embodiments or claims contained herein.

As best shown in FIG. **1**, the wheelchair lift assembly **12** includes a lift platform **13** that is reciprocally coupled to a lift frame (not shown). The lift frame is incorporated within a courtroom assembly A having a ground level B, such as a courtroom floor, an intermediate level C, such as a witness stand, and an upper level D, such as a judge's bench. The platform **13** is vertically translatable between at least the ground level B, the intermediate level C, and the upper level D by a driving assembly (not shown) well known in the art. It should be appreciated that while the barrier assembly **10** and wheelchair lift assembly **12** are shown being used in a courtroom assembly A, the barrier assembly **10** and wheelchair lift assembly **12** may instead be used in a variety of other environmental settings.

The courtroom assembly A further includes a lower landing door E hingedly coupled to the courtroom assembly A at the ground level B adjacent the wheelchair lift assembly **12** and an upper landing door F hingedly coupled to the courtroom assembly A at the upper level D adjacent the wheelchair lift assembly **12**. The hinges of the upper and lower landing doors E and F are spring-loaded such that the doors are urged into the closed positions when not being held open.

The wheelchair lift assembly **12** includes a suitable control system (not shown) having a programmable logic controller (PLC) that controls the operation of the lift platform **13** and the barrier assembly **10**. An internal control panel **24** and an external control panel **26** may be used to send command signals to the control system of the wheelchair assembly **12** when, for instance, a passenger wishes to move the lift platform **13** from one level to another. Moreover, the landing doors E and F include electric strike latches (not shown), and the control system does not actuate the lift platform **13** until the control system receives a signal that doors E and F are in the closed position. The control system also controls the operation of the barrier assembly **10**, which will be hereinafter described below.

Still referring to FIG. **1**, one representative embodiment of the barrier assembly **10** will now be described in detail. The barrier assembly **10** is operably coupled to the wheelchair lift assembly **12** at the intermediate level C. In use, the barrier assembly **10** is translated into a deployed position to protect a

passenger when the lift platform **13** is being raised or lowered or when the lift platform **13** is not positioned at the intermediate level C.

Referring now to FIG. **2**, the barrier assembly **10** includes a frame **28** having first and second side rails **30** and **32** disposed opposite one another. The first and second side rails **30** and **32** are substantially identical; therefore, only the first side rail **30** will be described. As can best be seen by referring to FIG. **3**, the first side rail **30** includes an L-shaped outer shell **33** having a horizontal portion **34** and a vertical portion **36**. A horizontal guide rail **35** is sized and shaped to be received within the horizontal portion **34** of the outer shell **33**, and a vertical guide rail **37** is sized and shaped to be received within the vertical portion **36** of the outer shell **33**. The horizontal and vertical guide rails **35** and **37** may be secured within the outer shell **33** with any suitable mechanical or chemical fasteners, such as screws, bolts, rivets, glue, epoxy, etc.

A plurality of cross-members **38***a*-**38***c* extend between the first and second side rails **30** and **32** to couple the side rails together and define the frame **28**. Preferably, the frame **28** includes first, second, and third cross-members **38***a*, **38***b*, and **38***c*, respectively; however, fewer or more than three cross-members may be used. In the embodiment shown, the first cross-member **38***a* spans between the proximal ends of the horizontal portions of the first and second slide rails **30** and **32**, the third cross-member **38***c* spans between corners of the first and second slide rails **30** and **32**, and the second cross-member **38***b* is positioned between the first and second cross-members **38***a* and **38***c*. A stop bracket **70** may also be provided, which extends between the first and second side rails **30** and **32**. The stop bracket **70** includes flanged ends **71** that are coupled to the horizontal portions **34** of the outer shells **33**.

At least a portion of the frame **28** is received within a mounting tray **43** for securing the barrier assembly **10** beneath the intermediate level C. When installed, the horizontal portions of the first and second side rails **30** and **32** are received within the mounting tray **43**, and the mounting tray **43** is received within an opening in the flooring defining the intermediate level C. Flanges **44** extending around the exterior of the mounting tray **43** rest on the flooring, and the mounting tray **43** is covered with a panel (not shown) made of steel, aluminum, wood, or another suitable material, wherein the panel is co-planar with the intermediate level C. The vertical portions of the first and second side rails **30** and **32** extend upwardly from beneath the intermediate level C and are preferably secured to at least a portion of a structural frame in the courtroom assembly A.

The vertical guide rails **37** of the frame **28** include a vertical guiding groove **76** formed along the length of the vertical guide rails **37**. The horizontal guide rails **35** include a lower horizontal guiding groove **78** formed along the bottom of the horizontal guide rail **35** and an upper horizontal guiding groove **79** formed along the top of the horizontal guide rail **35**. The lower horizontal guiding groove **78** is placed in communication with the vertical guiding groove **76** at its distal end by a first curved portion **81**. The lower horizontal guiding groove **78** and the upper horizontal guiding groove **79** are placed in communication at their proximal ends with a second curved portion **83**. The vertical guiding groove **76**, lower horizontal guiding groove **78**, and upper horizontal guiding groove **79** form one continuous guiding groove **74**. The horizontal and vertical guide rails **35** and **37** are preferably formed with a low-friction material, such as UHMW polyethylene or Nylatron®, such that a barrier in the form of a barrier segment assembly **40** may be slidably received within the guiding grooves **74** of the first and second side rails **30** and **32**.

Referring to FIG. **2**, the barrier segment assembly **40** is comprised of a plurality of extruded barrier segments **42** hingedly coupled to one another according to any suitable method well known in the art. The upper-most barrier segment **72** includes a shoulder (not shown) that rests against the stop bracket **70** when the barrier segment assembly **40** is in the stowed position.

A pin **68** protrudes from the ends of each barrier segment **42**. When assembled, the pins **68** are slidably received within the guiding grooves **74** formed within the first and second side rails **30** and **32**. The pins **68** are formed with a suitable low-fiction material, such as, but not limited to Delrin®, which allows the pins **68** to slide freely within the guiding grooves **74**. It should be appreciated that any suitable barrier element(s) may be used without departing from the spirit and scope of the present disclosure, As a non-limiting example, a solid piece of flexible material may instead be slidably disposed between the first and second side rails **30** and **32**.

A drive assembly **94** is operably coupled to the barrier segment assembly **40** for slidably translating the barrier segment assembly **40** within the guiding grooves **74**. The drive assembly **94** includes a drive axle **88** that spans between the first and second side rails **30** and **32**. Each end of the drive axle **88** coaxially receives a sprocket **80** and is thereafter journaled for rotation within openings in each side rail **30** and **32** in the corner defined by the intersection of the horizontal and vertical portions **35** and **37**. A sprocket cavity **82** is formed within each horizontal guide rail **35** such that the sprocket cavity **82** is in communication with the first curved portion **81** of the guiding groove **74**. The sprocket **80** is rotatably received within the sprocket cavity **82** such that the sprocket teeth engage the pins **68** when the barrier segment assembly is slidably received within the guiding groove **74**.

The drive assembly **94** further includes a motor **96** operably coupled to the drive axle **88** for selective rotation thereof. The motor **96** is coupled to the cross-member **38***c* through a motor mounting bracket **90** or similar device. The motor **96** rotatably drives the drive axle **88** about its center longitudinal axis through any conventional transmission, such as a roller chain assembly **98**. In the alternative, a drive belt assembly, gear assembly, etc. may instead be used to drive the drive axle **88**.

The rotation of the drive axle **88** rotates the sprockets **80** disposed on each end thereof. The rotation of the sprockets **80** drives the barrier segment assembly **40** within the guiding grooves **74** either upwards within the vertical guiding groove **76** or downwards into the upper and lower horizontal guiding grooves **79** and **78** between a barrier deployed position and a barrier stowed position.

The control system of the wheelchair lift assembly **12** controls the operation of the barrier assembly **10**. The barrier assembly **10** includes control components for communicating with the control system of the wheelchair lift assembly **12**. A plurality of electrical or mechanical sensors are coupled to the frame **28** for indicating the barrier segment assembly **40** position. The sensors also signal the control system of wheelchair lift assembly **12** to instruct the motor **96** to turn on, off, or reverse directions when actuated by the barrier segment assembly **40**. Preferably, a first mechanical limit switch **46** is mounted to the third cross member **38***c*, and a second mechanical limit switch **48** is mounted to the second cross-member **38***b*. Although any general purpose limit switches or proximity sensors may be used, adjustable roller lever limit switches are preferred.

The first limit switch **46** includes a lever arm pivotally mounted to a switching mechanism (not shown) within the limit switch **46**. The lever arm of the first limit switch **46** is

directed downwardly from the third cross-member **38***c* such that the barrier segment assembly **40** engages the lever arm when it is slidably received within the horizontal guiding groove **78**. When at least a portion of the barrier segment assembly **40** is slidably moved from the horizontal guiding groove **78** to the vertical guiding groove **76** (i.e. from the stowed position to the deployed position), the barrier segment assembly **40** disengages the lever arm of the first limit switch **46**, thereby actuating the switch and sending a signal to the control system to turn the motor **96** off. As a non-limiting example, and illustrated in FIG. **3**, as the barrier segment assembly **40** nears its fully deployed position, a portion of the barrier segment assembly **40** disengages the limit switch **46**, as described above.

The lever arm of the second limit switch **48** is directed upwardly from the second cross-member **38***b* such that when the barrier segment assembly **40** is substantially received within the horizontal guiding grooves **78** and **79** (i.e. in the stowed position), the barrier segment assembly **40** engages the lever arm of the second limit switch **48**, thereby actuating the switch and sending a signal to the control system to turn the motor **96** off.

The motor **96** may include a spring-loaded break (not shown) for maintaining the barrier segment assembly **40** in the deployed position. The break may be applied when power to the motor **96** is removed, and the break may be released when the motor **96** is activated by the wheelchair lift assembly **12** control system to move the barrier segment assembly **40** into the stowed position.

A plurality of optional sensors (not shown) may also be electrically connected to the barrier assembly **10** for detecting approaching pedestrians or other moving objects, which can prevent the barrier segment assembly **40** from being deployed. Further, the barrier assembly **10** or wheelchair lift assembly **12** may include other electrical sensors (not shown), such as tape-switches or optical sensors, or over-current circuitry (not shown) that prevent the barrier segment assembly **40** from being further deployed when the upper-most barrier segment **72** of the barrier segment assembly **40** is obstructed. The motor **96**, limit switches **46** and **48**, and any optional sensors (i.e. tape switches or optical sensors) or over-current circuitry positioned within the barrier assembly **10** are electrically connected in any well known manner to the wheelchair lift assembly **12** through an electrical terminal **50**.

In operation, the barrier segment assembly **40** is moved between a deployed position and a stowed position. In the courtroom assembly A, the barrier segment assembly **40** is moved into the deployed position by the control system before the lift platform **13** can be vertically translated. The barrier segment assembly **40** is moved into the stowed position when the lift platform **13** is at the intermediate level C, and a person desires to move between the intermediate level C and the lift platform **13**.

Referring to FIGS. **1-3**, to move the barrier assembly **10** into the deployed position, the wheelchair lift assembly **12** is activated by depressing an appropriate button or switch on the internal control panel **24** or the external control panel **26**. The control system of the wheelchair lift assembly **12** receives the signal that the lift platform **13** is about to be moved, and the motor **96** of the barrier assembly **10** is energized. The motor **96** rotates the drive axle **88** and sprockets **80**, causing the barrier segment assembly **40** to slidably move upwardly into the vertical guiding grooves **76** until the barrier segment assembly **40** disengages the first limit switch **46** and the motor **96** turns off. In the deployed position, substantially all of the barrier segment assembly **40** is received within the vertical guiding grooves **76** to define a protective barrier. The barrier assembly **10** remains in the deployed position until the passenger wishes to exit at the intermediate level C.

Referring to FIG. **4**, the barrier assembly **10** is moved into the stowed position when, for example, the lift platform **13** reaches the intermediate level C and the passenger wishes to move from the lift platform **13** to the intermediate level C. At this point, the motor **96** is energized, causing the drive axle **88** and sprockets **80** to rotate, thereby slidably moving the barrier segment assembly **40** downwardly into the horizontal guiding grooves **78** and **79**. In the depicted embodiment, the barrier segment assembly **40** is substantially received within the lower and upper horizontal guiding grooves **78** and **79** such that a portion of the barrier segment assembly **40** is doubled back upon itself within the upper horizontal guiding grooves **79**. However, it should be appreciated that a smaller barrier segment assembly **40** would only be received within the lower horizontal guiding grooves **78** in the stowed position.

When the barrier segment assembly **40** is substantially received within the horizontal guiding grooves **78** and **79**, the shoulder of the upper-most barrier segment **72** abuts the stop bracket **70**. Moreover, in the depicted embodiment, the barrier segment assembly **40** engages the second limit switch **48** and actuates the switch **48** to turn off the motor **96**. At this time, the barrier segment assembly **40** is in the stowed position and the passenger may move from the lift platform **13** to the intermediate level C.

Referring to FIG. **5**, an alternate embodiment of a barrier assembly **110** is depicted in combination with a wheelchair lift assembly **112**. The wheelchair lift assembly **112** includes a convertible stair/lift mechanism for moving a person from a lower surface to a vertically displaced upper surface and having a number of retractable stairs (such as the wheelchair lift depicted in U.S. Pat. No. 6,601,677B1). The barrier assembly **110** is translated into a deployed position to protect a passenger when the lift platform of the wheelchair lift assembly **112** is being raised or lowered, or when the stairs are retracted or when the lift platform is not positioned at the upper level. However, it should be appreciated that the barrier assembly **110** may be used with any suitable wheelchair lift assembly.

As can best be seen by referring to FIG. **6**, the barrier assemblies **10** and **110** are substantially identical in materials, construction, and operation except for the differences that will be hereinafter described. The first and second side rails **130** and **132** of the barrier assembly **110** include a longitudinal hollow element **136** that is suitably shaped to slidably receive a first longitudinal segment **160** within the upper portion of the longitudinal hollow element **136**. The first longitudinal segment **160** is preferably formed with a low friction material, such as UHMW polyethylene or Nylatron®, so that the first longitudinal segment **160** may slide freely within the longitudinal hollow element **136**. Both the longitudinal hollow element **136** and the first longitudinal segment **160** include a vertical guiding groove **176** (partially hidden by the barrier segment assemble **140**) formed therewithin that is adapted to slidably receive the barrier segment assembly **140**.

The longitudinal hollow element **136** of the second side rail **132** is shown partially broken away to reveal a second longitudinal segment **186** fixedly received within the lower portion of the longitudinal hollow element **136**. An extension spring **184** extends between the first and second longitudinal segments **160** and **186** to urge the first longitudinal segment **160** downwardly within the longitudinal hollow element **136**. An end cap **161** received on the upper end of the first longitudinal segment **160** abuts the end of the longitudinal hollow element

136 and prevents the first longitudinal segment **160** from being fully received within the longitudinal hollow element **136**.

The wheelchair assembly **112** includes a control system for controlling the movement of the barrier segment assembly **140** within guiding groove **174** of the frame **128**. A plurality of electrical or mechanical sensors are coupled to the frame **128** for indicating the barrier segment assembly **140** position. The sensors also signal the control system of the wheelchair lift assembly **112** to instruct the motor **196** to turn on, off, or reverse directions when actuated by the barrier segment assembly **140**. Preferably, first and second mechanical limit switches **146** and **148** are mounted to the third cross member **138***c*. Although any general purpose limit switches or proximity sensors may be used, adjustable roller lever limit switches are preferred.

The first limit switch **146** includes a lever arm pivotally mounted to a switching mechanism (not shown) within the limit switch **146**. The lever arm of the first limit switch **146** is directed downwardly from the third cross-member **138***c* such that the barrier segment assembly **140** engages the lever arm when it is slidably received within the horizontal guiding groove **178**. As described above with respect to the first embodiment, when the barrier segment assembly **140** is slidably moved from the horizontal guiding groove **178** to the vertical guiding groove **176** (i.e. from the stowed position to the deployed position), the barrier segment assembly **140** disengages the lever arm of the first limit switch **146**, thereby actuating the switch and sending a signal to the control system to turn the motor **196** off.

The lever arm of the second limit switch **148** is directed upwardly from the third cross-member **138***c* such that the barrier segment assembly **140** engages the lever arm when it is slidably received within the upper horizontal guiding groove **179**. When the barrier segment assembly **140** is substantially received within the horizontal guiding groove **179** (i.e. in the stowed position), the barrier segment assembly **140** engages the lever arm of the second limit switch **148**, thereby actuating the switch and sending a signal to the control system to turn the motor **196** off.

To translate the barrier assembly **10** into the deployed position, the drive assembly **194**, which is substantially similar in construction and operation to the drive assembly **94**, is activated to slidably move the barrier segment assembly **140** upwardly within the vertical guiding groove **176**, as described above. When the barrier segment assembly **140** engages the upper end of the vertical guiding groove **176**, the barrier segment assembly **140** urges the longitudinal segment **160** upwardly, extending from the longitudinal hollow element **136** so that the barrier segment assembly **140** and the first longitudinal segment **160** move upwardly together. The drive assembly **194** continues to drive the barrier segment assembly **140** upwardly until the first limit switch **146** is actuated and the motor **196** turns off.

To move the barrier assembly **110** into the stowed position, the drive assembly **194** is activated to slidably move the barrier segment assembly **140** downwardly within the vertical guiding grooves **176**. The first longitudinal segments **160** are urged downwardly by the extension spring **184** when the barrier segment assembly **140** is lowered such that the barrier segment assembly **140** and the first longitudinal segment **160** move downwardly together. The drive assembly **194** continues to drive the barrier segment assembly **140** downwardly into the horizontal guiding grooves **178** and **179** until the barrier segment assembly **140** is substantially received within the horizontal guiding grooves **178** and **179** and the second limit switch **148** is actuated to turn off the motor **196**.

While illustrative embodiments have been illustrated and described, it will be appreciated that various changes can be made therein without departing from the spirit and scope of the invention as claimed.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A lift assembly, comprising:

(a) a lift frame;

(b) a lift platform reciprocally coupled to the lift frame and moveable between a raised position, wherein the lift platform is substantially coplanar with a first support surface, and a lowered position, wherein the lift platform is substantially coplanar with a second support surface;

(c) first and second vertical support structures extending upwardly from the first support surface to define an opening providing access to the first support surface; and

(d) a barrier assembly, comprising:

(i) a frame having a first side rail and a second side rail, the first and second side rails each having a horizontal portion and a vertical portion, the horizontal portions disposed beneath the first support surface and the vertical portions extending upwardly from the first support surface and coupled to the first and second vertical support structures;

(ii) a flexible barrier slidably disposed between the first and second side rails, the flexible barrier moveable between at least a stowed position and a deployed position, wherein at least a portion of the flexible barrier is disposed between the horizontal portions of the first and second side rails when the barrier is in the stowed position, and wherein the flexible barrier is substantially disposed between the vertical portions of the first and second side rails when the flexible barrier is in the deployed position; and

(iii) a drive assembly operably coupled to the barrier for selectively moving the barrier between at least the stowed position and the deployed position.

2. The lift assembly of claim **1**, wherein the first and second side rails each include a vertical portion that is selectively extendable.

3. The lift assembly of claim **1**, wherein the barrier comprises a plurality of longitudinal barrier segments hingedly coupled to one another.

4. The lift assembly of claim **3**, wherein the longitudinal barrier segments include a first end and a second end, and wherein first and second pins are coupled to the first and second ends of each barrier segment, the first and second pins slidably received within the first and second side rails.

5. The lift assembly of claim **1**, further comprising at least one sensor for limiting the movement of the barrier within the first and second side rails.

6. The lift assembly of claim **1**, further comprising at least one sensor for stopping deployment of the barrier when an object is detected by the at least one sensor.

7. Lift assembly of claim **1**, further comprising at least one sensor for stopping deployment of the barrier when at least a portion of the barrier is obstructed.

8. A lift assembly, comprising

(a) a lift frame;

(b) a lift platform reciprocally coupled to the lift frame and moveable between a raised position, wherein the lift platform is substantially coplanar with a first support surface, and, a lowered position, wherein the lift platform is substantially coplanar with a second support surface;

(c) first and second vertical support structures extending upwardly from the first support surface to define an opening providing access to the first support surface; and

(d) a barrier assembly, comprising:

(i) a frame having a first side rail and a second side rail, the first and second side rails each having a horizontal portion and a vertical portion, the horizontal portions disposed beneath the first support surface and the vertical portions extending upwardly from the first support surface, the vertical portions coupled to the first and second vertical support structures; and

(ii) a flexible barrier slidably disposed between the first and second side rails, the barrier drivable between at least a stowed position and a deployed position, wherein the barrier is in the stowed position when the platform is at a predetermined position and is not being moved between the raised and lowered positions, and wherein the barrier is in the deployed position when the platform is at a predetermined position or is being moved between the raised and lowered positions, and wherein the barrier is substantially disposed between the horizontal portions of the first and second side rails when the barrier is in the stowed position, and wherein the barrier is substantially disposed between the vertical portions of the first and second side rails when the barrier is in the deployed position.

9. The lift assembly of claim **8**, wherein the first and second side rails each include a vertical portion that is selectively extendable.

10. The lift assembly of claim **8**, wherein the barrier comprises a plurality of longitudinal barrier segments hingedly coupled to one another.

11. The lift assembly of claim **10**, wherein the longitudinal barrier segments include a first end and a second end, and wherein first and second pins are coupled to the first and second ends of each barrier segment, the first and second pins slidably received within the first and second side rails.

12. The lift assembly of claim **8**, further comprising at least one sensor for limiting the movement of the barrier within the first and second side rails.

13. The lift assembly of claim **8**, further comprising at least one sensor for stopping deployment of the barrier when an object is detected by the at least one sensor.

14. The lift assembly of claim **8**, further comprising at least one sensor for stopping deployment of the barrier when at least a portion of the barrier is obstructed.

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UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 7,766,127 B2
APPLICATION NO. : 11/470529
DATED : August 3, 2010
INVENTOR(S) : D. Morris et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

COLUMN	LINE	ERROR
8 (Claim 7, line 1)	57	"Lift assembly" should read --The lift assembly--
8 (Claim 8, line 1)	60	After "A lift assembly, comprising" insert --:--
8 (Claim 8, line 6)	65	"surface, and, a lowered position," should read --surface, and a lowered position--

Signed and Sealed this

Sixteenth Day of November, 2010

David J. Kappos

David J. Kappos
Director of the United States Patent and Trademark Office